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The Patent Office
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I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that by virtue of an assignment registered under the Patents Act 1977, the application is now proceeding in the name as substituted.

I also certify that the attached copy of the request for grant of a Patent (Form 1/77) bears an amendment, effected by this office, following a request by the applicant and agreed to by the Comptroller-General.

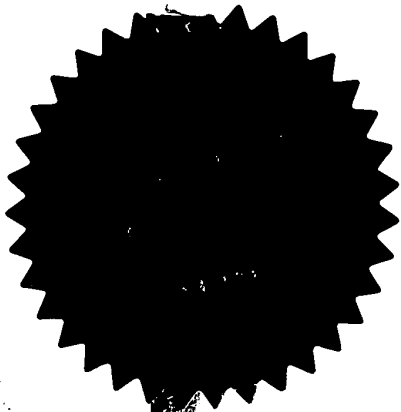
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Dated

8 JUN 2000

GB9910584.3

By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of

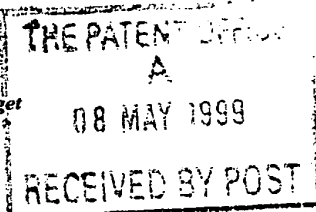
SOUTHFIELDS (FABRIC SYSTEMS) LIMITED,
Incorporated in the United Kingdom,
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United Kingdom

[ADP No. 07873540001]



Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)



The Patent Office

Cardiff Road
Newport
Gwent NP9 1RH

1. Your reference

A 1304

2. Patent application number

(The Patent Office will fill in this part)

9910584.3

- 8 MAY 1999

3. Full name, address and postcode of the or of each applicant (underline all surnames)

SOUTHFIELDS COACHWORKS LTD.
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Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

United Kingdom

4. Title of the invention

REINFORCED CLOSURES FOR GOODS CONTAINERS

5. Name of your agent (if you have one)

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

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Patents ADP number (if you know it)

DEATH JACKSON ASSOCIATES
THE OLD YARD
LOWER TOWN
CLARENDON
WORCESTER WR3

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7/2/99

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

Yes

- a) any applicant named in part 3 is not an inventor, or
- b) there is an inventor who is not named as an applicant, or
- c) any named applicant is a corporate body.

See note (d))

REINFORCED CLOSURES FOR GOODS CONTAINERS

This invention relates to composite material suitable for use as, or as part of, closure means for vehicle bodies or other goods containers. In particular, it relates to a slash-resistant composite material suitable for use as, or as part of, the curtain of curtain-sided goods containers, that is, goods containers having in one or more sides thereof a loading (or unloading) aperture which is closable by a sliding curtain.

Curtain-sided vehicles have become firmly established in the road transport industry owing to the ease with which, when the curtains are retracted, they can be loaded and unloaded by means of fork-lift trucks. The curtains are normally sheets of PVC suspended at their upper edge portion by runners or sliders moving along a track disposed longitudinally of the vehicle body, and tension in the vertical dimension of the curtain is provided by the use of strap and buckle devices by means of which vertical reinforcements of the curtain, usually strips of webbing material, are secured to the respective side rave of the vehicle body.

Although curtain-sided vehicles enjoy considerable commercial success, they suffer from a disadvantage in that the conventional flexible PVC curtains do not offer very much

resistance to the action of thieves in slashing the curtains with knives or similar instruments and thereby gaining access to the interior of the vehicle body and its contents.

5 The present invention now provides a composite material suitable for use as, or as part of, closure members for vehicle bodies and other goods containers, which is highly resistant to slash attack.

10 In a first aspect the present invention provides a composite material suitable for use as, or as part of, a closure for a vehicle body or other goods container, comprising a slash-resistant mesh layer of metal filaments, at least one face of said layer having a weather-resistant covering.

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In a preferred form of the invention the mesh layer of the composite material contains no textile fabric.

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In a second aspect the present invention provides a curtain for a curtain-sided vehicle body or other goods container, which comprises a sheet of a composite material according to the first aspect of the invention; means to suspend the curtain from an upper portion of said container; and means to secure the curtain in place with respect to said container.

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The metal filaments of the mesh layer can be disposed to one another in any convenient manner. Thus, they can, for example, be entwined with one another (for instance by weaving or other


textile procedure) or overlaid and secured together, for instance by a melding or a bonding procedure. The metal filaments can, for example, be present as continuous or discontinuous strands.

5 Where the mesh layer is a woven material comprising warp filaments and weft filaments, the metal wire or other filamentary material of the warp is preferably the same or similar filament material as that of the weft. Any convenient weaving pattern can be used, for example a square weave.

10 The interstices defined by the metal filaments can be of any suitable shape and size. For example, where the filaments are disposed in the form of a mesh, for example in a woven pattern or a welded mesh, the interstices of the mesh can be
15 substantially of square or other rectangular shape. The side dimensions of such mesh interstices can be, for example in the range 3mm to 12mm, especially 5mm to 10mm.

20 The metal filaments are conveniently of steel in order to provide sufficient strength though, if desired, other metals can be used. Where the metal is mild steel or other metal susceptible to corrosion, it preferably has a corrosion-resistant coating; suitable corrosion resistant materials are, for example, those known as being suitable for coating steel
25 filaments in radial tyres, for instance zinc, copper or brass.

The metal filaments are conveniently in a multi-filamentary form. Thus, for example, the metal filaments are conveniently



in the form of two, three or more strands each comprising a plurality of filaments, for example, two, three or four.

With reference to the weather-resistant covering referred to above, it can be, for example, in the form of a laminate with the mesh layer. Whether or not a laminate, said covering can be, for example, a plastics material, for example a polyurethane, or polyvinyl chloride (PVC). Whatever coating material is used it should preferably provide the desirable characteristics of conventional PVC curtains used for curtain-sided vehicles, including flexibility and a weather-proof, or at least weather-resistant capability. The plastics material is preferably present on both faces of the mesh layer. A preferred form of coating material is a layer of polyurethane applied to one or both faces of mesh layer. If desired, the polyurethane can be applied to only one face of the mesh layer but, in general, it is preferred that it be applied to both faces. It is generally found that application of a polyurethane paste to one face of the mesh layer results in the polyurethane penetrating the interstices of the mesh layer thereby providing a securement for the coating. It is preferred that, whatever method is used to apply the polyurethane or other plastics material coating to the mesh layer, it should result in the plastics material becoming firmly bonded to the mesh layer, for example, by penetrating the interstices (or at least some of the interstices) between the filaments of the mesh layer.

Although the invention is described herein with particular

reference to the plastics material being coated on the mesh layer by application of a paste composition, other means can be used, for example by using the plastics material in pre-formed sheet form and securing the sheet to the mesh layer by pressing, rolling or adhesive, or any combination thereof.

There is usually no need to use any supplementary means, for example adhesive or other bonding agent, between the mesh layer and the weather resistant covering, provided that care is taken to ensure that satisfactory securement is attained, for example using the procedures referred to above.

Where the mesh layer is a woven sheet the warp and weft are conveniently arranged at a right angle to each other.

In a further form of the invention the composite material contains two or more of said mesh layers. This form can comprise, for example, an assembly of two of the mesh layers in face-to-face relationship, the outer faces (or outermost faces where there are more than two sheets mesh layers) having a coating of flexible plastics material or other weather-resistant covering. An alternative structure comprises an assembly of two sheets of composite material according to the first aspect of the present invention, each sheet comprising a mesh layer having on both faces thereof a coating of flexible plastics material and the two sheets of composite material being secured together at the interface between adjacent surfaces of plastics material. The number of mesh layers that can be used will depend on their

flexibility and on the flexibility required in the closure; the greater the flexibility of the components, especially the mesh layers, the greater the number of such sheets can be used.

5 Not all of the composite material embodiments referred to in the preceding paragraph are flexible enough for satisfactory use in a curtain-sided goods container. However, these more rigid embodiments are suited for use as structural panels for more rigid goods containers, for example motor vans.

10 In those embodiments of the composite material of the invention which contain more than one mesh layer, it is preferred that the pattern of the mesh is not coincident in both or, where there are more than two mesh layers, in all of them, whereby the resistance of the composite material to slash attack is enhanced.

15 This non-coincidental pattern can be effected, for example, by providing that the direction of the metal filaments is not identical in the two or more mesh layers, for example by arranging the two or more mesh layers so that the directions of the metal filaments in adjacent sheets are off-set from each other by an angle (for example an angle in the range 5° to 20° ,
20 for instance 10°) and/or by offsetting the pattern of at least one mesh layer from that of the other mesh layer or mesh layers.

With regard to the curtains that constitute the second aspect of the present invention, a sheet or sheets of composite
25 material according to the first aspect of the invention can be used either for the whole area of the curtain or only for part of it. Where the composite material is used for the whole area securement means of a suitable size, for example bolts of small

diameter, can be used said means passing through apertures between adjacent metal filaments of the mesh layer or layers.

In one form of curtain of the present invention the composite material does not extend as far as the upper edge portion of the curtain, the upper edge portion being provided, for example, by a sheet of conventional curtain material secured to the upper edge of the composite material. In practice, this latter arrangement does not detract substantially from the security provided by the curtain, because most attempts to slash conventional curtains are made against the lower portion of the curtain.

EXAMPLE

There is now described, by way of example, a slash-resistant composite material according to the present invention and suitable for use in a curtain of a curtain-sided vehicle body.

The composite material comprises a mesh layer of steel filaments in the form of a woven sheet of a net or web structure. The composite material has a thickness of 1.5mm and has, on each of its two faces, a weather-resistant polyurethane coating. Both warp and weft of the woven sheet are of steel cable comprising three strands each of three filaments, the filaments having a diameter of 0.18mm and having a zinc coating as a corrosion-resistant layer. The pitches of the warp and weft are substantially the same, being about 5mm. The weaving pattern is a square weave. However, if desired, other weaving patterns can be used.

The following Table shows, by way of example, characteristics of the woven sheet and its warp and its weft. Preferred values for the various characteristics are shown under the heading "range" and specific examples are shown under the heading "example".

TABLE

	<u>Example</u>	<u>Preferred Range</u>
<u>Warp and Weft - steel filaments</u>		
3x3x0.18VZ		
pics per m	200	180 to 220
cord diameter mm	0.73	0.63 to 0.83
linear density g/m	1.80	1.70 to 1.90
breaking force N	539	524 to 548
mass of zinc g/kg	72.5	68.9 to 75.4
<u>Thickness of the woven</u>		
sheet mm	0.9	0.7 to 1.2

The metal strands of the weft are uni-directional and the weft and warp are disposed at substantially a right angle to each other.

The polyurethane coating on the woven sheet - in the present instance a coating on both faces of the sheet - had been applied in the form of a reactive polyurethane paste pre-mixed from its

reactants shortly before the application. The paste was applied, as a first coating, to the reverse face of the sheet (that is, the face to be disposed inwardly in the eventual curtain) followed by rolling, then, as a second coating to the obverse face of the sheet. Each coating penetrates the interstices of the woven sheet and comes into adhesive contact with the other coating thereby to form a firmly bonded composite material.

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